AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-9 (Canceled).

Claim 10 (Currently Amended) A composition comprising a polymerase including a polymerase tag covalently bonded to a site on the polymerase and nucleotide or analog types for the polymerase, where at least one nucleotide or analog type includes a nucleotide tag bonded to a part of the nucleotide that is released due to action of the polymerase as the nucleotide is being incorporated, where at least one of the tags has a fluorescence property that undergoes a change ~~before,~~ during ~~and/or after~~ each of a sequence of nucleotide ~~incorporations~~ incorporation cycles due to an interaction between the polymerase and the nucleotide and where the polymerase lacks the ability to remove a previously incorporated nucleotide.

Claims 11-15 (Canceled).

Claim 16 (Currently Amended) The composition of claim 10, wherein each ~~type of the nucleotide or analog types,~~ nucleotide or analog type comprises a deoxynucleotide triphosphate (dNTP) or analog and the nucleotide tag is covalently

bonded either directly or through a linker to the part of the dNTP or analog that is released due to action of the polymerase during nucleotide incorporation.

Claim 17 (Previously Presented) The composition of claim 10, wherein the fluorescence property comprises a duration, an intensity and/or frequency of emitted fluorescent light.

Claim 18 (Currently Amended) The composition of claim 10, wherein the polymerase tag comprises a fluorescent tag and wherein the fluorescence property is fluorescence resonance energy transfer (FRET), where either the nucleotide tag or the polymerase tag comprises a donor and the other tag comprises an acceptor ~~and where FRET occurs when the two tags are in close proximity~~.

Claims 19-49 (Canceled).

Claim 50 (Currently Amended) A composition comprising a polymerase including a polymerase tag covalently bonded to a site on the polymerase and deoxynucleotide triphosphate (dNTP) or analog types for the polymerase, where at least one dNTP types includes a nucleotide tag covalently bonded directly or through a linker to a part of the dNTP that is ~~release~~ released upon dNTP incorporation due to action of the polymerase, where at least one of the tags has a fluorescence property that undergoes

a change ~~before,~~ during ~~and/or after~~ each of a sequence of dNTP ~~incorporations~~ incorporation cycles due to an interaction between the polymerase and the dNTP.

Claim 51 (Previously Presented) The composition of claim 50, wherein the polymerase is a reverse transcriptase.

Claim 52 (Canceled).

Claim 53 (Previously Presented) The composition of claim 51, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

Claim 54 (Previously Presented) The composition of claim 50, wherein the fluorescence property comprises a duration, an intensity and/or frequency of emitted fluorescent light.

Claim 55 (Currently Amended) The composition of claim 50, wherein the polymerase tag comprises a fluorescent tag and wherein the fluorescence property is fluorescence resonance energy transfer (FRET), where the polymerase tag comprises a donor and the nucleotide tags comprise acceptors ~~and where FRET occurs when the two tags are in close proximity~~.

Claims 56-63 (Canceled).

Claim 64 (Currently Amended) A composition comprising a polymerase including a polymerase tag covalently bonded to a site on the polymerase and a deoxynucleotide triphosphate (dNTP) or analog types for the polymerase, where at least one dNTP type includes a dNTP tag covalently bonded directly or through a linker to the γ phosphate group of the dNTP or analog, where at least one of the tags has a fluorescence property that undergoes a change ~~before,~~ during ~~and/or after~~ each of a sequence of dNTP ~~incorporations~~ incorporation cycles due to an interaction between the polymerase and the dNTP.

65 (Previously Presented) The composition of claim 64, wherein the polymerase comprises a reverse transcriptase.

Claim 66 (Canceled).

Claim 67 (Previously Presented) The composition of claim 65, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

Claim 68 (Previously Presented) The composition of claim 64, wherein the fluorescence property comprises a duration, an intensity and/or frequency of emitted fluorescent light.

Claim 69 (Currently Amended) The composition of claim 64, wherein the polymerase tag comprises a fluorescent tag and wherein the fluorescence property is fluorescence resonance energy transfer (FRET), where either the nucleotide tag or the polymerase tag comprises a donor and the other tag comprises an acceptor ~~and where FRET occurs when the two tags are in close proximity~~.

Claim 70 (Canceled).

Claim 71 (Currently Amended) A composition comprising a polymerase including a polymerase tag covalently bonded to a site on the polymerase and nucleotide or analog types for the polymerase, where at least one nucleotide or analog type includes a molecular nucleotide tag covalently bonded directly or through a linker to the terminal phosphate of the nucleotide, where at least one of the tags has a fluorescence property that undergoes a change ~~before,~~ during ~~and/or after~~ each of a sequence of nucleotide incorporations due to an interaction between the polymerase and the nucleotide.

Claim 72 (Previously Presented) The composition of claim 71, wherein the polymerase comprises a reverse transcriptase.

Claim 73 (Canceled).

Claim 74 (Previously Presented) The composition of claim 72, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

Claim 75 (Canceled).

Claim 76 (Previously Presented) The composition of claim 71, wherein the fluorescence property comprises a duration, an intensity and/or frequency of emitted fluorescent light.

Claim 77 (Currently Amended) The composition of claim 71, wherein the polymerase tag comprises a fluorescent tag and wherein the fluorescence property is fluorescence resonance energy transfer (FRET), where the polymerase tag comprises a donor and the other nucleotide tags comprise-an acceptors ~~and where FRET occurs when the two tags are in close proximity~~.

Claim 78 (Canceled).

Claim 79 (Currently Amended) A composition comprising a polymerase including a polymerase tag covalently bonded to a site on the polymerase lacking 3' to 5' exonuclease activity and nucleotide types for the polymerase, where at least one nucleotide or analog type includes a nucleotide tag bonded to a part of the nucleotide that is released upon nucleotide incorporation due to action of the polymerase, where at

least one of the tags has a fluorescence property that undergoes a change ~~before,~~ during ~~and/or after~~ each of a sequence of nucleotide ~~incorporations~~ incorporation cycles due to an interaction between the polymerase tag and the nucleotide tag and where the site comprises a naturally occurring cysteine site or a cysteine replacement site in the polymerase selected so that the site is less than or equal to about 50 Å from a tag on each incorporating nucleotide and is a site that is not involved in the function of the polymerase and the polymerase tag is covalently bonded to the naturally occurring cysteine site or the cysteine replacement site through its SH group.

Claim 80 (Previously Presented) The composition of claim 79, wherein the site is less than or equal to about 15 Å from a tag on each incorporating nucleotide.

Claim 81 (Previously Presented) The composition of claim 79, wherein the site is less than or equal to about 10 Å from a tag on each incorporating nucleotide.

Claim 82 (Previously Presented) The composition of claim 79, wherein the polymerase comprises a reverse transcriptase.

Claim 83 (Canceled).

Claim 84 (Previously Presented) The composition of claim 82, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

Claim 85 (Previously Presented) The composition of claim 79, wherein each of the nucleotides comprises a deoxynucleotide triphosphate (dNTP) and the nucleotide tag is covalently bonded directly or through a linker to the pyrophosphate moiety of its dNTP.

Claim 86 (Previously Presented) The composition of claim 79, wherein the fluorescence property comprises a duration, an intensity and/or frequency of emitted fluorescent light.

Claim 87 (Currently Amended) The composition of claim 79, wherein the polymerase tag comprises a fluorescent tag and wherein the fluorescence property is fluorescence resonance energy transfer (FRET), where the polymerase tag comprises a donor and the nucleotide tags comprises acceptors ~~and where FRET occurs when the two tags are in close proximity~~.

Claim 88 (Canceled).

Claim 89 (Currently Amended) A composition comprising a polymerase including a molecular polymerase tag covalently bonded to a site on the polymerase and a nucleotide including a molecular tag covalently bonded to a part of the nucleotide that is released upon nucleotide incorporation, where at least one of the tags has a

fluorescence property that undergoes a change ~~before,~~ during ~~and/or after~~ each of a sequence of nucleotide ~~incorporations~~ incorporation cycles due to an interaction between the polymerase tag and the nucleotide tag and where the site comprises a naturally occurring cysteine site or a cysteine replacement site in the polymerase selected so that the site is less than or equal to about 50 Å from a tag on each incorporating nucleotide and the polymerase tag is covalently bonded to the naturally occurring cysteine site or the cysteine replacement site through its SH group.

Claim 90 (Previously Presented) The composition of claim 89, wherein the site is less than or equal to about l5 Å from a tag on each incorporating nucleotide.

Claim 91 (Previously presented) The composition of claim 89, wherein the site is less than or equal to about 10 Å from a tag on each incorporating nucleotide.

Claim 92 (Previously Presented) The composition of claim 89, wherein the polymerase comprises a reverse transcriptase.

Claims 93-94 (Canceled).

Claim 95 (Previously Presented) The composition of claim 92, wherein the reverse transcriptase comprises HIV-1 reverse transcriptase.

Claim 96 (Previously Presented) The composition of claim 89, wherein each of the nucleotides comprises a deoxynucleotide triphosphate (dNTP) and the nucleotide tag is covalently bonded directly or through a linker to the terminal phosphate group of its dNTP.

Claim 97 (Previously Presented) The composition of claim 89, wherein the fluorescence property comprises a duration, an intensity and/or frequency of emitted fluorescent light.

Claim 98 (Currently Amended) The composition of claim 97, wherein the polymerase tag comprises a fluorescent tag and wherein the fluorescence property is fluorescence resonance energy transfer (FRET), where the polymerase tag comprises a donor and the nucleotide tags comprise acceptors ~~and where FRET occurs when the tow tags are in close proximity~~.

Claim 99 (Canceled)

Claim 100 (Previously Presented) The composition of claim 50, wherein the polymerizing agent lacks the ability to remove a previously incorporated nucleotide.

Claim 101 (Canceled)

Claim 102 (Previously Presented) The composition of claim. 64, wherein the polymerase is free of or lacks the ability to remove a previously incorporated nucleotide.

Claim 103 (Previously Presented) The composition of claim 71, wherein the polymerase is free of or lacks the ability to remove a previously incorporated nucleotide.

Claim 104 (Previously Presented) The composition of claim 89, wherein the polymerase is free of or lacks the ability to remove a previously incorporated nucleotide.

Claim 105 (Previously Presented) The composition of claim 79, wherein the site is less than or equal to about 25 Å from a tag on each incorporating nucleotide.

Claim 106 (Previously Presented) The composition of claim 89, wherein the site is less than or equal to about 25 Å from a tag on each incorporating nucleotide.

Claim 107 (Canceled).

Claim 108 (Previously Presented) The composition of claim 10, wherein the polymerase comprises a genetically engineered polymerase comprising a native polymerase including one cysteine residue replacement or a plurality of cysteine residue replacements at one site or a plurality of sites of the native polymerase, where the site or sites are not in contact with other proteins, where the site or sites do not alter the

conformation or folding of the polymerase, where the site or sites are not involved in the functioning of the polymerase, and where the polymerase tag is bonded to the polymerase through a cysteine residue replacement or through a plurality of cysteine residue replacements.

Claim 109 (Previously Presented) The composition of claim 50, wherein the polymerase comprises a genetically engineered polymerase comprising a native polymerase including one cysteine residue replacement or a plurality of cysteine residue replacements at one site or a plurality of sites of the native polymerase, where the site or sites are not in contact with other proteins, where the site or sites do not alter the conformation or folding of the polymerase, where the site or sites are not involved in the functioning of the polymerase, and where the polymerase tag is bonded to the polymerase through a cysteine residue replacement or through a plurality of cysteine residue replacements.

Claim 110 (Previously Presented) The composition of claim 64, wherein the polymerase comprises a genetically engineered polymerase comprising a native polymerase including one cysteine residue replacement or a plurality of cysteine residue replacements at one site or a plurality of sites of the native polymerase, where the site or sites are not in contact with other proteins, where the site or sites do not alter the conformation or folding of the polymerase, where the site or sites are not involved in the functioning of the polymerase, and where the polymerase tag is bonded to the

polymerase through a cysteine residue replacement or through a plurality of cysteine residue replacements.

Claim 111 (Previously Presented) The composition of claim 71, wherein the polymerase comprises a genetically engineered polymerase comprising a native polymerase including one cysteine residue replacement or a plurality of cysteine residue replacements at one site or a plurality of sites of the native polymerase, where the site or sites are not in contact with other proteins, where the site or sites do not alter the conformation or folding of the polymerase, where the site or sites are not involved in the functioning of the polymerase, and where the polymerase tag is bonded to the polymerase through a cysteine residue replacement or through a plurality of cysteine residue replacements.